

REMARKS

In the last Office Action, the Examiner rejected claim 1 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,396,067 to Enters et al. ("Enters") in view of French Patent No. 2,631,206 to Gabillat et al. ("Gabillat"). Claim 2 was rejected under 35 U.S.C. §103(a) as being unpatentable over Enters in view of Gabillat and further in view of U.S. Patent No. 4,132,280 to Jones et al. ("Jones") and Japanese Patent No. 5-15223 to Oshima et al. ("Oshima"). Additional art was cited of interest.

In accordance with the present response, original independent claim 1 has been amended to further patentably distinguish from the prior art of record. Original claims 1-2 have also been amended in formal respects to improve the wording and bring them into better conformance with U.S. practice. New claims 3-16 have been added to provide a fuller scope of coverage. A new abstract which more clearly reflects the invention to which the amended and new claims are directed has been substituted for the original abstract.

Applicants respectfully request reconsideration of their application in light of the following discussion.

Brief Summary of the Invention

The present invention is directed to a walk-behind tiller.

As described in the specification (pgs. 1-3), conventional walk-behind tillers have been difficult to operate during a tilling, turning and/or transporting operation. Additionally, the conventional walk-behind tillers require a large number of components and a rather complex structure for the purpose of providing the required maneuverability during operation.

The present invention overcomes the drawbacks of the conventional art. Figs. 1-13 show an embodiment of a walk-behind tiller 10 according to the present invention embodied in amended independent claim 1. The walk-behind tiller 10 has a body 11 having a forward end and a rear end. An axle 13a is mounted on the rear end of the body 11. A pair of left and right travel wheels 13 is mounted to opposite ends of the axle 13a for undergoing rotation about a rotational axis to cause the walk-behind tiller 10 to undergo travelling along a ground surface G. A tilling device 15 is mounted on the body 10 forwardly of the left and right travel wheels 13 for undergoing three different types of moving operations. During a first movement operation, the tilling device 15 travels along or makes a turn on the ground surface G while the

tilling device 15 is disposed in spaced-apart relation to the ground surface G (Fig. 8). During a second movement operation, the tilling device 15 tills the ground G (Fig. 10). During a third movement operation, the tilling device 15 is maintained generally horizontal to the ground surface G (Fig. 12).

A handle 18 has left and right proximal portions 61, 62 extending upwardly from the rear end of the body 11. Left and right horizontal grips 64, 65 of the handle 18 extend rearwardly from respective ones of the proximal portions 61, 62 and are configured to be gripped by an operator to maintain the tilling device 15 generally horizontal to the ground surface G during the third movement operation. Left and right rising portions of the handle 18 extend upwardly from respective ones of the left and right horizontal grips 64, 65 in a direction generally orthogonal to the proximal portions 61, 62 and are configured to be tilted forwardly and downwardly by the operator during the second movement operation to cause the tilling device 15 to till the ground G. The handle 18 also has a cross portion 68 disposed between upper ends of the left and right rising portions 66, 67 and are configured to be gripped and depressed by the operator to produce a downward force tending to lift the tilling device 15 upward about the rotational axis to maintain the tilling device 15 in spaced-apart relation to the ground surface G.

According to another feature of the present invention embodied in amended claim 2, a clutch is mounted on the body 11 and a clutch lever 38 is mounted on the handle 18 for undergoing pivotal movement relative to the handle 18 from a first position (shown in chain double-dashed line in Fig. 7) to place the clutch in an engaged state to a second position (shown in solid line in Fig. 7) to place the clutch in a disengaged state. The clutch lever 38 has left and right support end portions 71, 72 pivotally mounted on at least one of the left and right horizontal grips 64, 65. Left and right first lever portions 73, 74 of the clutch lever 38 extend rearwardly from respective ones of the left and right support end portions 71, 72 and have a shape corresponding to that of respective ones of the left and right horizontal grips 64, 65 of the handle 18. Left and right second lever portions 75, 76 of the clutch lever 38 extend upwardly from respective ones of the left and right first lever portions 73, 74 and have a shape corresponding to that of respective ones of the left and right rising portions 66, 67 of the handle 18.

By the foregoing construction, the walk-behind tiller according to the present invention can be easily maneuvered by an operator to turn or transport the walk-behind tiller and/or to conduct a tilling operation with higher efficiency as compared to the conventional art. Additionally,

the walk-behind tiller of the present invention has a simple construction and is economical to manufacture.

Traversal of Prior Art Rejections

Claim 1 was rejected under 35 U.S.C. §103(a) as being unpatentable over Enters in view of Gabillat. Applicants respectfully traverse this rejection and submit that the combined teachings of Enters and Gabillat do not disclose or suggest the subject matter recited in amended independent claim 1.

Amended independent claim 1 is directed to a walk-behind tiller and requires a walk-behind tiller having a body having a forward end and a rear end, an axle mounted on the rear end of the body, a pair of left and right travel wheels mounted to opposite ends of the axle for undergoing rotation about a rotational axis to cause the walk-behind tiller to undergo travelling along a ground surface, and a tilling device mounted on the body forwardly of the left and right travel wheels for undergoing a first movement operation in which the tilling device travels along or makes a turn on the ground surface while the tilling device is disposed in spaced-apart relation to the ground surface, a second movement operation in which the tilling device tills the ground, and a third movement operation in which the tilling device is

maintained generally horizontal to the ground surface. Amended claim 1 further requires a handle having left and right proximal portions extending upwardly from the rear end of the body, left and right horizontal grips extending rearwardly from respective ones of the proximal portions and configured to be gripped by an operator to maintain the tilling device generally horizontal to the ground surface during the third movement operation, left and right rising portions extending upwardly from respective ones of the left and right horizontal grips in a direction generally orthogonal to the proximal portions and configured to be tilted forwardly and downwardly by the operator during the second movement operation to cause the tilling device to till the ground, and a cross portion disposed between upper ends of the left and right rising portions and configured to be gripped and depressed by an operator to produce a downward force tending to lift the tilling device upward about the rotational axis to maintain the tilling device in spaced-apart relation to the ground surface. No corresponding structural and functional combination is disclosed or suggested by the combined teachings of Enters and Gabillat.

The primary reference to Enters discloses a work vehicle having a tilling device 16, a pair of wheels 14, and a handle 28 for maneuvering the work vehicle (Figs. 1-3). As

acknowledged by the Examiner, Enters does not teach the specific structure of the handle recited in amended independent claim 1. Furthermore, Enters clearly does not disclose or suggest the specific movement operations (i.e., the first, second and third movement operations) of the tilling device and the specific structure of the handle (i.e., grips, rising portions, and cross portion) for effecting such movement operations, as recited in amended independent claim 1.

The secondary reference to Gabillat discloses a lawn mower having a handle 8 for maneuvering the lawn mower (Fig. 1). The handle 8 is configured primarily to permit an operator to maneuver the lawn mower while cutting blades perform a grass cutting operation. Stated otherwise, the handle 8 of the lawn mower in Gabillat is configured to perform just a single operation (i.e., maneuver the lawn mower to cut grass) in conjunction with the cutting blades.

In contrast, amended claim 1 requires a handle having specific portions each associated with a specific operation of the tilling device. More specifically, amended claim 1 recites a handle having the following structure and corresponding functions which are not disclosed or suggested by Gabillat:

(1) left and right horizontal grips extending rearwardly from respective ones of the proximal portions and

configured to be gripped by an operator to maintain the tilling device generally horizontal to the ground surface during the third movement operation;

(2) left and right rising portions extending upwardly from respective ones of the left and right horizontal grips in a direction generally orthogonal to the proximal portions and configured to be tilted forwardly and downwardly by the operator during the second movement operation to cause the tilling device to till the ground; and

(3) a cross portion disposed between upper ends of the left and right rising portions and configured to be gripped and depressed by an operator to produce a downward force tending to lift the tilling device upward about the rotational axis to maintain the tilling device in spaced-apart relation to the ground surface.

Since Gabillat does not disclose or suggest the foregoing structure and corresponding functions of the handle recited in amended independent claim 1, it does not cure the deficiencies of Enters. Accordingly, one ordinarily skilled in the art would not have been led to modify the references to attain the claimed subject matter.

In view of the foregoing, applicants respectfully request that the rejection of claim 1 under 35 U.S.C. §103(a) as being unpatentable over Enters in view of Gabillat be withdrawn.

Claim 2 was rejected under 35 U.S.C. §103(a) as being unpatentable over Enters in view of Gabillat and further in view of Jones and Oshima. Applicants respectfully traverse this rejection and submit that the combined teachings of Enters, Gabillat, Jones and Oshima do not disclose or suggest the subject matter recited in amended claim 2.

Enters in view of Gabillat does not disclose or suggest the subject matter of amended independent claim 1, from which claim 2 depends, as set forth above for the rejection of claim 1 under 35 U.S.C. §103(a).

The Examiner cited the secondary references to Jones and Oshima for their disclosure of clutch levers having a shape which mirrors the shape of the handle. However, neither Jones nor Oshima discloses or suggests a handle having the specific structure (i.e., grips, rising portions, cross portion) and corresponding functions (i.e., first-third movement operations of the tilling device) recited in amended independent claim 1, from which claim 2 depends. Accordingly, Jones and Oshima do not cure the deficiencies of Enters as modified by Gabillat, and one ordinarily skilled in the art would not have been led to modify the references to attain the claimed subject matter.

In view of the foregoing, applicants respectfully request that the rejection of claim 2 under 35 U.S.C. §103(a) as being unpatentable over Enters in view of Gabillat and further in view of Jones and Oshima be withdrawn.

Applicants respectfully submit that new claims 3-16 also patentably distinguish from the prior art of record.

Claims 3-8 depend on and contain all of the limitations of amended independent claim 1 and, therefore, distinguish from the references at least in the same manner as claim 1.

New independent claim 9 is directed to a walk-behind tiller and requires a body having a forward end and a rear end, a pair of travel wheels mounted on the body for undergoing rotation about a rotational axis to cause the walk-behind tiller to undergo travelling along a ground surface, and a tilling device mounted on the body for undergoing a first movement operation in which the tilling device travels along or makes a turn on the ground surface while the tilling device is disposed in spaced-apart relation to the ground surface, a second movement operation in which the tilling device tills the ground, and a third movement operation in which the tilling device is maintained generally horizontal to the ground surface. Claim 9 further requires a handle having proximal portions extending from the body, a pair of grip

portions extending from respective ones of the proximal portions and configured to be gripped by an operator to maintain the tilling device generally parallel to the ground surface during the third movement operation, a pair of rising portions extending from respective ones of the grip portions and configured to be tilted by the operator during the second movement operation to cause the tilling device to till the ground, and a cross portion disposed between the rising portions and configured to be gripped and pressed by an operator to produce a force tending to move the tilling device about the rotational axis to maintain the tilling device in spaced-apart relation to the ground surface. No corresponding structural and functional combination is disclosed or suggested by the prior art of record as set forth above for amended independent claim 1. For example, the cited references to Enters, Gabillat, Jones and Oshima do not disclose or suggest a handle having the specific structure (i.e., grips, rising portions, cross portion) and corresponding functions (i.e., first-third movement operations of the tilling device) recited in independent claim 9.

Claims 10-16 depend on and contain all of the limitations of independent claim 9 and, therefore, distinguish from the prior art of record at least in the same manner as claim 9.

In view of the foregoing amendments and discussion,
the application is believed to be in allowable form.
Accordingly, favorable reconsideration and allowance of the
claims are most respectfully requested.

Respectfully submitted,

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Name



Signature

July 6, 2004

Date

ABSTRACT OF THE DISCLOSURE

A walk-behind tiller has a body and a pair of wheels mounted on the body for undergoing rotation to cause the walk-behind tiller to undergo travelling along a ground surface. A tilling device is mounted on the body for undergoing a first movement operation in which the tilling device travels along the ground surface while the tilling device is disposed in spaced-apart relation to the ground surface, a second movement operation in which the tilling device tills the ground, and a third movement operation in which the tilling device is maintained generally horizontal to the ground surface. A handle has proximal portions, a pair of grip portions connected to the proximal portions and configured to be gripped by an operator to maintain the tilling device generally parallel to the ground surface during the third movement operation, a pair of rising portions connected to the grip portions and configured to be tilted by the operator during the second movement operation to cause the tilling device to till the ground, and a cross portion disposed between the rising portions and configured to be gripped and pressed by an operator to produce a force tending to move the tilling device about the rotational axis to maintain the tilling device in spaced-apart relation to the ground surface.